## REMARKS

1. Status of the Application

Claims 1–11 were originally pending in the application. None of the claims have been amended or canceled, and thus claims 1-11 remain at issue in the current application.

2. Rejection of the Claims in view of Kerr et al.

Claims 1-11 stand rejected under 35 U.S.C. §102(e) as being anticipated by, or in the alternative, under 35 U.S.C. 103 (a) as obvious over WO 98/28376 to Kerr et al. In order for a reference to act as a §102 bar to patentability, the reference must teach each and every element of the claimed invention. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 771 (Fed. Cir. 1983). Without the required teaching of "each and every element" as set forth in the claims, it is improper to maintain such rejections under §102(e). Kerr et al. do not teach each and every element of the claimed invention, and thus fails as an anticipatory reference. Similarly, Applicants' invention is also not obvious in view of Kerr et al. Supporting the distinction of Applicants' invention from that of Kerr et al. is the enclosed Declaration of one of the inventors, Danny Charles Thompson.

The present invention is directed to release liners. In the invention, a radiation curable silicone release agent is dispersed in an organic solvent and then applied onto the surface of a substrate. Because the invention uses radiation curable silicone systems, metallic catalysts that are required in thermally cured silicone systems can be avoided. Dispersion of the silicone release agent in an organic solvent provides for smoother surfaces, better uniform coating and better adhesion of the release agent. The coated substrate is exposed to conditions sufficient to remove the solvent, e.g., heating optionally in the presence of high velocity air. The substrate is then exposed to radiation to cure the silicone release agent.

Many silicone release agents can be cured thermally in the presence of metallic initiators, such as platinum catalyst. Typically, thermally cured systems are solvent based systems. However, in view of increasing environmental concerns regarding the use of solvents, solventless silicone release systems have been developed that are radiation cured. Solventless systems, as described in Kerr et al., however, can also have drawbacks. For example, radiation cured systems can require high coat weights to achieve the desired level of release, which can, in turn, increase costs. In addition, unreacted or non-crosslinked silicones can be present in the cured silicone release layer.

Applicants' invention allows for the manufacture of a release liner having significantly reduced amounts of undesirable components, such as reduced total silicone extractables and/or volatile silicone compounds. Unexpectedly, the inventors have found that the invention allows the manufacture of a release liner having significantly reduced amounts of undesirable components. Although not wishing to be bound by any explanation of the invention, it is currently believed that treating the coated substrate with heat and/or high velocity air not only drives off the solvent, but also provides molecular agitation of the compositions. As a result, volatile silicone compounds, which are present in such compositions, can be driven off as well, thereby reducing the amounts of such compounds in the cured product. Preferably, the release liners of the invention have no more than about 10 parts per million of such compound in the cured product. Low levels of volatiles results in a product useful in the electronics industry

Kerr et al. is directed to release compositions having a curable epoxyorganosiloxane, a cross-linkable silicone hydride resin having no epoxy functionality and a curing agent. The composition can be coated onto a substrate and cured using actinic radiation to provide surface release properties. Kerr et al. do not use a solvent to disperse the composition. Kerr et al. also does not use the same curing temperatures as in the present invention Further, Kerr et al. discourage using solvent, and thus actually **teach away** from using solvent for applying a silicone release composition. Kerr et al. specifically cite the growing concern over the environment and the stringent restrictions on recovery of solvents, as a reason not to use solvents in these applications (p.1, lines 32 to p. 2, lines 1-2). Thus, because Kerr et al. actually discourage the use of a solvent, it further does not teach or suggest Applicants' invention.

Applicants' invention is substrate which includes a radiation curable silicone release agent in an organic solvent. Application of the radiation curable silicone release materials in a solvent forms a release liner having significantly reduced amounts of total extractables and/or volatile organic compounds, while using lower coat weights as compared to solventless radiation cured systems (p. 3, lines 19-28). Use of a solvent provides for the added advantages of improved release characteristics, including a smoother surface, and better uniform coating.

Despite differences in composition between Applicants' invention and Kerr et al., and the lack of a solvent and thermal curing step in Kerr et al., the assertion is made that Applicants' invention is anticipated by Kerr et al., or alternatively, obvious in view of Kerr et al. This assertion is made apparently because the composition and curing temperature used by Applicant is alleged to

be the same as that in Kerr et al.; therefore, the resulting products would inherently have the same properties. With regard to the Examiner's evocation of inherency to reject the claims, Applicants respectfully assert that the use of this argument is erroneous.

"To establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999).

Applicants respectfully submit that the Examiner has misapplied the concept of "inherency" in view of the Kerr et al. reference. Further, "[i]n relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic *necessarily* flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Int'f 1990). As demonstrated above, this is not the case here. The missing elements/function is ***not necessarily*** present in Kerr et el. Therefore, the evocation of inherency here is erroneous.

The Examiner alleges that because the same materials and process steps are used in Kerr et al. as in Applicants' invention, the resulting products inherently have the same properties. If not inherent, then it is alleged that Applicants' invention, and specifically the lower extractables and volatiles present in Applicants' invention, would be obvious in view of Kerr et al. However, Applicants' invention is completely different from that of Kerr et al. This fact is likewise set forth in the enclosed Declaration of Mr. Thompson. Notably, the formulation of Kerr et al. involves a crosslinkable silicon hydride resin compound (page 4, lines 9-10). This component is **not required** in Applicants' invention, and as such, is not described or claimed in Applicants' invention. Applicants' composition is undeniably different from the composition of Kerr et al. Thus, it does not follow that the distinct differences in the two formulations would lead to a finding of inherency or obviousness between the products of Kerr et al. and Applicants.

Applicants' invention is substrate which includes a radiation curable silicone release agent in an organic solvent. Application of the radiation curable silicone release materials in a solvent forms a release liner having significantly reduced amounts of total extractables and/or volatile organic compounds, while using lower coat weights as compared to solventless radiation cured systems (p. 3, lines 19-28). It is noted in the Office Action that "Kerr et al. disclose that the composition can be solvent free (page 16, lines 1-5), which would appear to yield a volatile-free

coating." (Office Action, p. 3). However, Kerr et al. does not teach or suggest the need to reduce the total extractables and volatile silicones, much less teach or suggest a technique to solve this problem.

The differences in the invention of Applicants and Kerr et al. is highlighted in the Examples of the present invention. For instance, the release liners of Kerr et al. in Examples 7-9 were prepared conventionally, that is, without solvent and without a thermal treatment step. Indeed, because radiation curable compounds are used in Kerr et al. it would be counterintuitive to employ a thermal treatment step, because by definition, radiation curable systems are cured using radiation, and not thermal energy. As discussed above, the thermal treatment step used in Applicants' invention is believed to provide molecular agitation so as to stir up low molecular weight volatile compounds present in radiation curable silicone systems and drive these off, along with the solvent. Without the thermal treatment step, Examples 7-9 of Kerr et al. would not achieve the significantly reduced levels of volatile silicones as claimed in the present invention, much less levels as low as 2 parts per million.

Notably, and as discussed in the enclosed Declaration, Example 6 of the present invention provides comparative data regarding the total volatile compound content of Samples C and D, prepared according to the invention, and Sample E, prepared without solvent and cured without a heating step, such as shown in Example 1 of Kerr et al. As the table demonstrates, the total amount of volatile siloxane compounds significantly increases when a thermal pretreatment step is not employed. Specifically, the total siloxanes listed in Sample C is 57 nanograms/square centimeter, while Sample D lists the total siloxanes as 32 nanograms/square centimeter. These values can be contrasted to the control Example E, the same as Kerr's Example 1, wherein the total siloxanes are measured at 474 nanograms/square centimeter (See Declaration, ¶7). Thus, data presented in the application as filed demonstrates that conventional UV curable silicone release compositions applied to a substrate without a thermal treatment step, for example, as shown in Examples 7-9 of Kerr et al. would not have a volatile compound content of less than 10 parts per million. Applicants' products are undeniably different from those of Kerr et al.

Notwithstanding the fact that an inherency rejection fails to render the claims anticipated or obvious, on a basic level, in order to support an anticipation or obviousness rejection based on inherency the Examiner must provide factual and technical grounds establishing that the inherent feature necessarily flows from the teachings in the prior art. The Examiner has made no such

showing. Applicants respectfully assert that Kerr et al. does not anticipate or render obvious Applicants' claims under an inherency argument and, therefore, respectfully request that the rejection under §102(e) or alternatively, under 103(a) be withdrawn with respect to Claims 1-11.

3. Rejection of the Claims in view of Leir et al.

Claims 1-16 and 9-11 stand rejected under 35 U.S.C. §102(e) as being anticipated by, or in the alternative, under 35 U.S.C. 103 (a) as obvious over U.S. Patent No. 5,753,346 to Leir et al. In order for a reference to act as a §102 bar to patentability, the reference must teach each and every element of the claimed invention. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 771 (Fed. Cir. 1983). Without the required teaching of "each and every element" as set forth in the claims, it is improper to maintain such rejections under §102(e). Leir et al. do not teach each and every element of the claimed invention, and thus fails as an anticipatory reference. Similarly, Applicants' invention is also not obvious in view of Leir et al.

Leir et al. describe a radiation cured silicone release coating from solutions of relatively low levels of a polyorganosiloxane substituted with small amounts of reactive functional groups dissolved in a co-reactive monomer or mixture of monomers and containing a photoactive catalyst (col. 4, lines 21-28). Leir et al. state "a need exists for rapidly curing silicone coating which can be rapidly and completely **cured in air**" (emphasis added) (col. 4, lines 4-5). This statement is supported by the Examples of Leir et al., in which it is stated that "[t]he solvent was allowed to evaporate at room temperature . . .." (col. 12, lines 23-24). Contrary to the statements made in the Office Action, Leir et al. does not teach or suggest the use of curing temperatures set forth in Applicants' invention.

Furthermore, Leir et al., does not disclose the need for a release liner having significantly reduced amounts of total extractables and/or volatile organic compounds, as taught and claimed by Applicants. Indeed, Leir et al. does not even mention any measurement of extractables or volatiles in its disclosure. Again, in the Office Action the statement is made that "Leir et al. disclose that the solvent is evaporated from the coating, which would appear to yield a volatile-free coating." This "inherency" argument again fails for the reasons stated above relating to Kerr et al. Specifically, as has been demonstrated in Applicants' invention (Example 6) the total volatile compound content is significantly lower when a thermal pretreatment step is employed in contrast to conventional UV curable silicone release compositions applied to a substrate without a thermal treatment step.

Again, the Examiner must provide factual and technical grounds establishing that the inherent feature necessarily flows from the teachings in the prior art. For the reasons stated above in relation to Kerr et al., the Examiner has not made such a showing, and the rejection of Claims 1-6 and 9-11 as being anticipated, or alternatively, obvious in view of Leir et al., fails.

Finally, Claims 7 and 8 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Leir et al. The rejected claims depend from independent claim 1 discussed above. Further, each of these dependent claims necessarily includes all of the limitations of the base independent claim from which it depends. If an independent claim is non-obvious under §103, then any claim depending therefrom is also non-obvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). As such, Applicants submit that the rejected claims are not obvious for the above reasons as well.

## Conclusion

In view of the arguments presented above, Applicants respectfully submit that Claims 1-11 are now in condition for allowance, and such action is respectfully requested.

Respectfully submitted,

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